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Correll

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[54] **MATABLE BLANK AND FOOD CARTON**

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[21] Appl. No.: **697,502**

[22] Filed: **Aug. 26, 1996**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 289,306, Aug. 11, 1994, Pat. No. 5,553,771.

[51] **Int. Cl.**[6] **B65D 5/20**

[52] **U.S. Cl.** **229/150**; 229/128; 229/190; 229/935

[58] **Field of Search** 229/128, 149, 229/148, 150, 160, 190, 933, 935, 936

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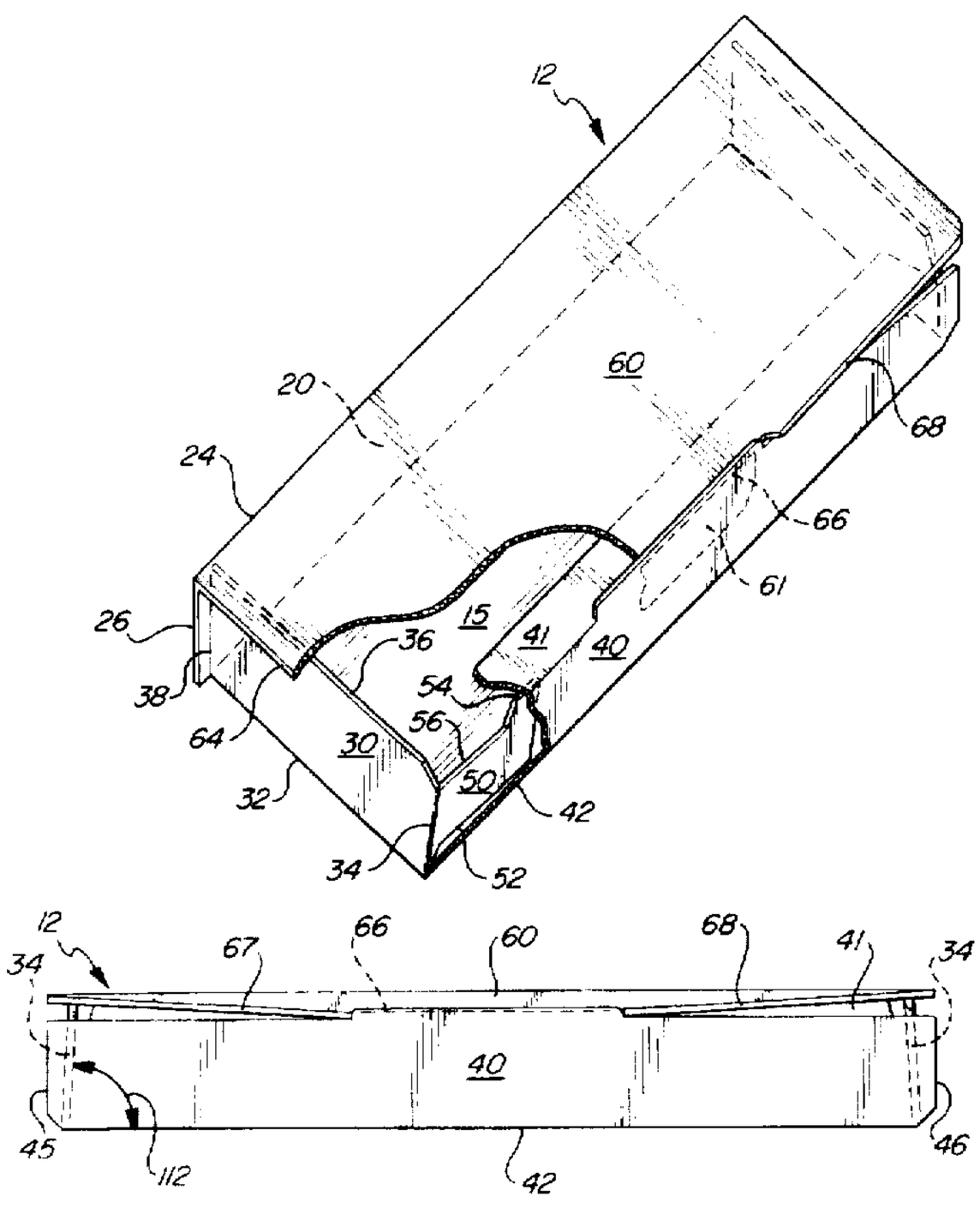
Photo I: A Blank of B–Flute Pizza Box Used by a Pizza Company –Photographer J. Corroll –Aug. 1996.

Primary Examiner—Gary E. Elkins

[57] **ABSTRACT**

An easily-folded E-flute corrugated carton for pizza, breadsticks, donuts, and the like. The carton is formed from a matable, alignable blank that reduces material consumption and cost. Key structural elements include (a) a front-edge-sloping cover with free side edges, (b) a rear wall with free ends, (c) parallel side walls each with a free rear end and free top edge, (d) inward-slope-creating corner flaps on front corners of the side walls, and (e) proportional bottom panel dimensions that allow the box to have acceptable load-carrying capacity, or box cavity volume.

25 Claims, 4 Drawing Sheets



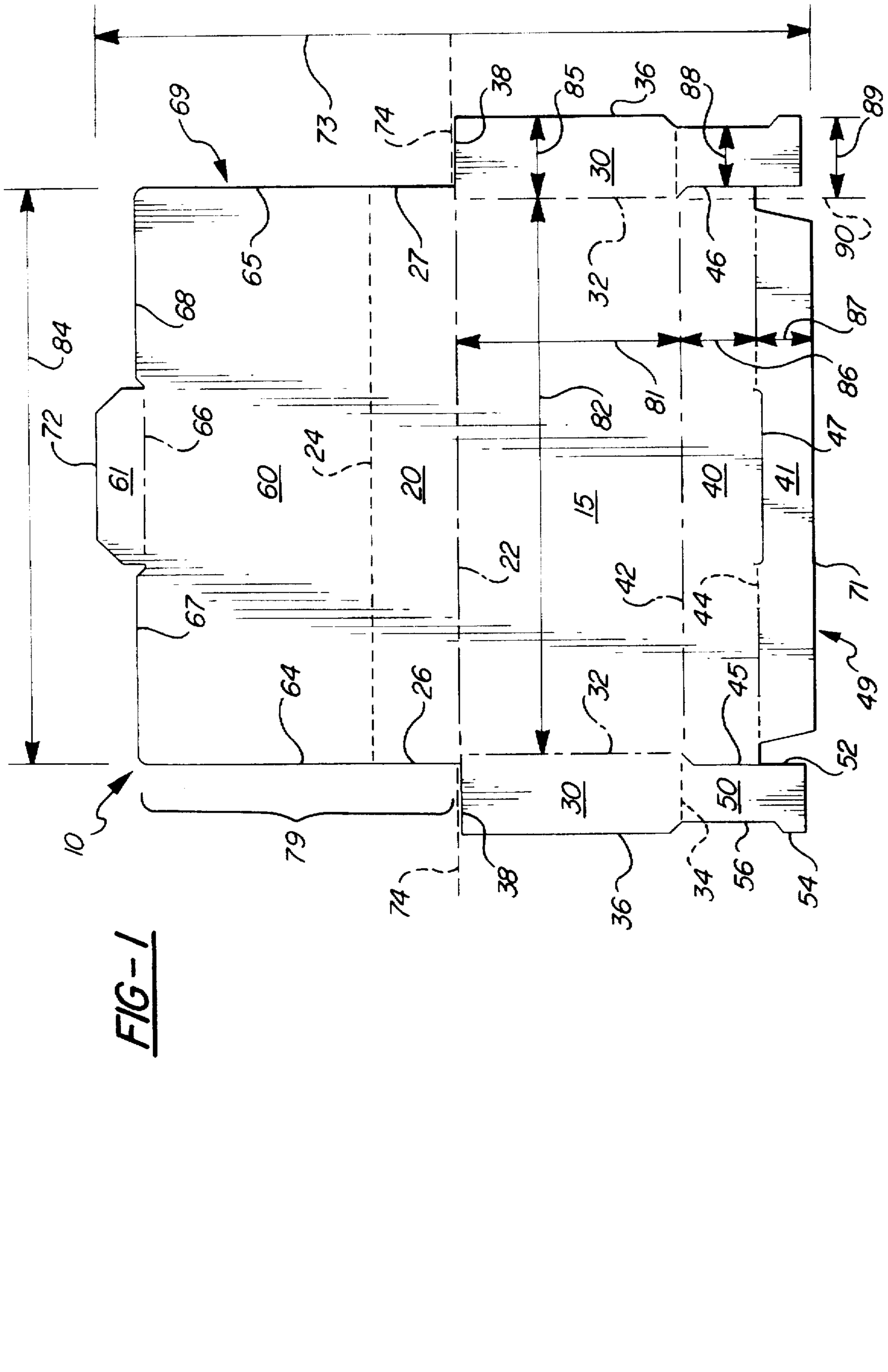

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FIG-1

FIG-2

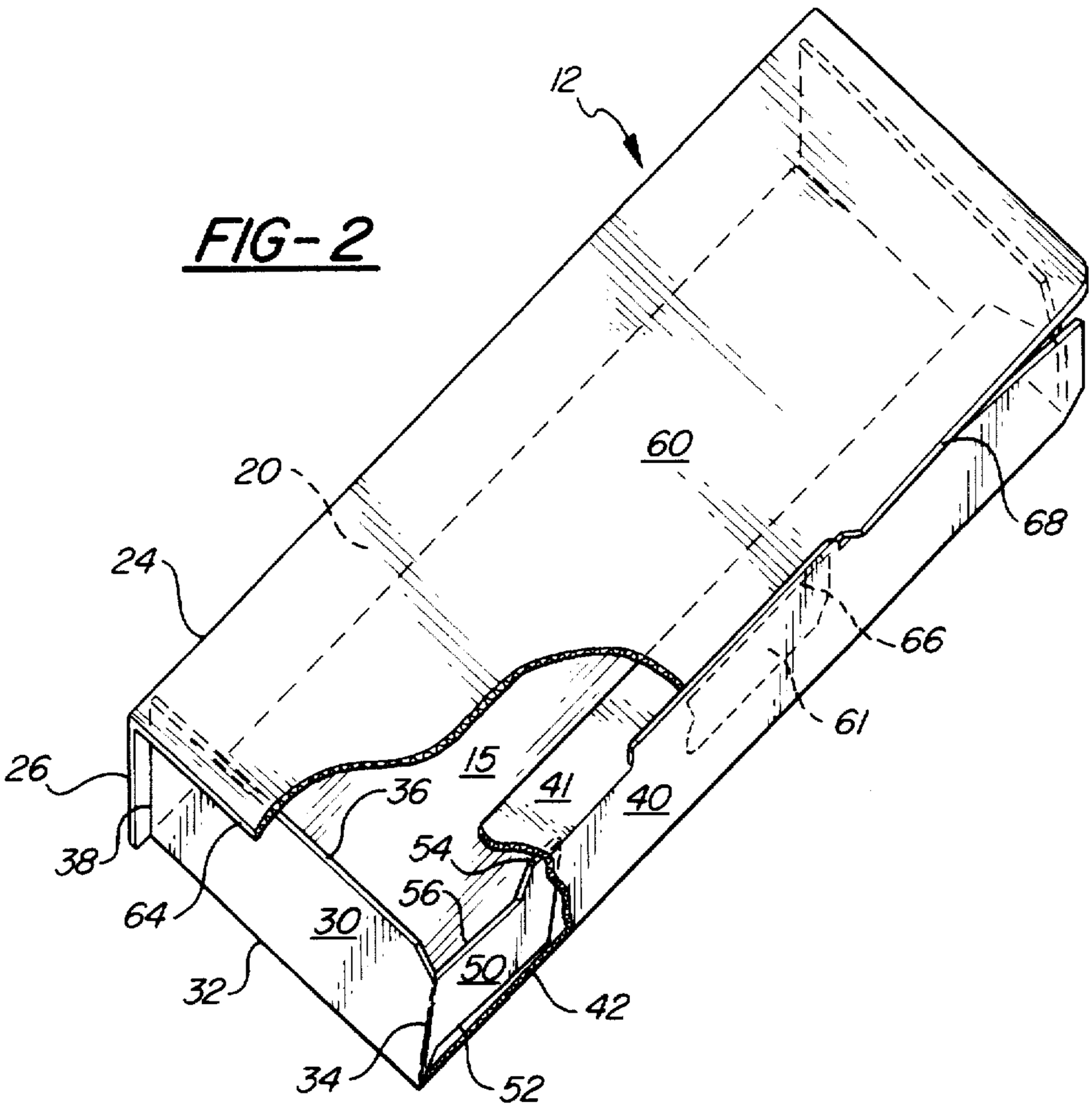
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FIG-3

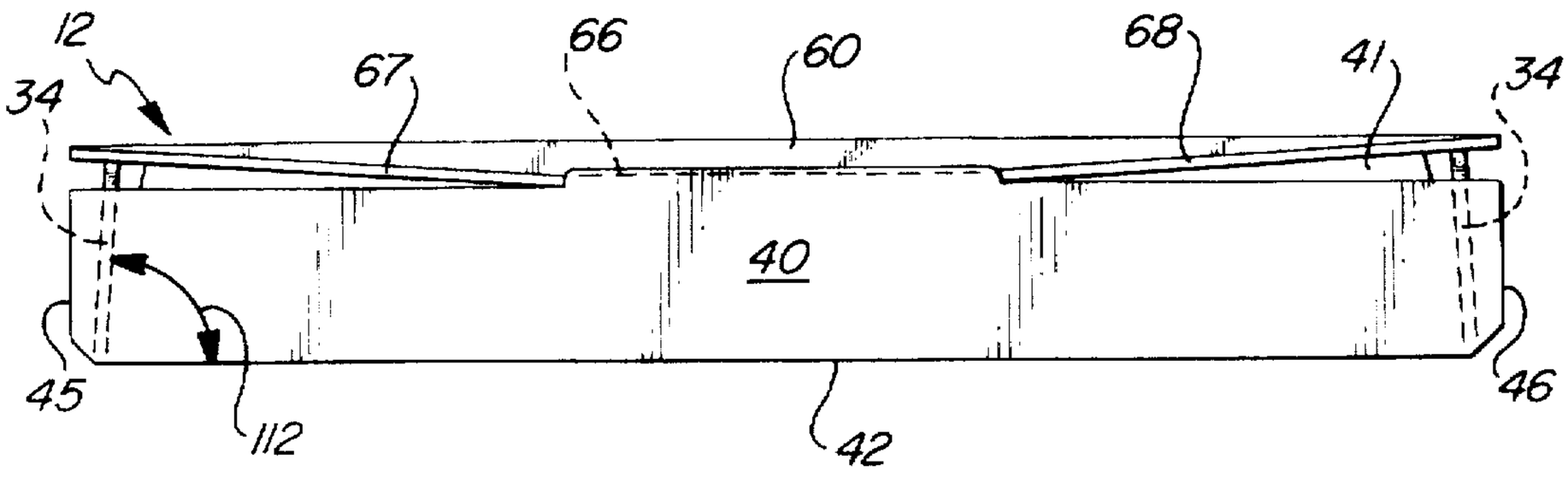
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FIG-4

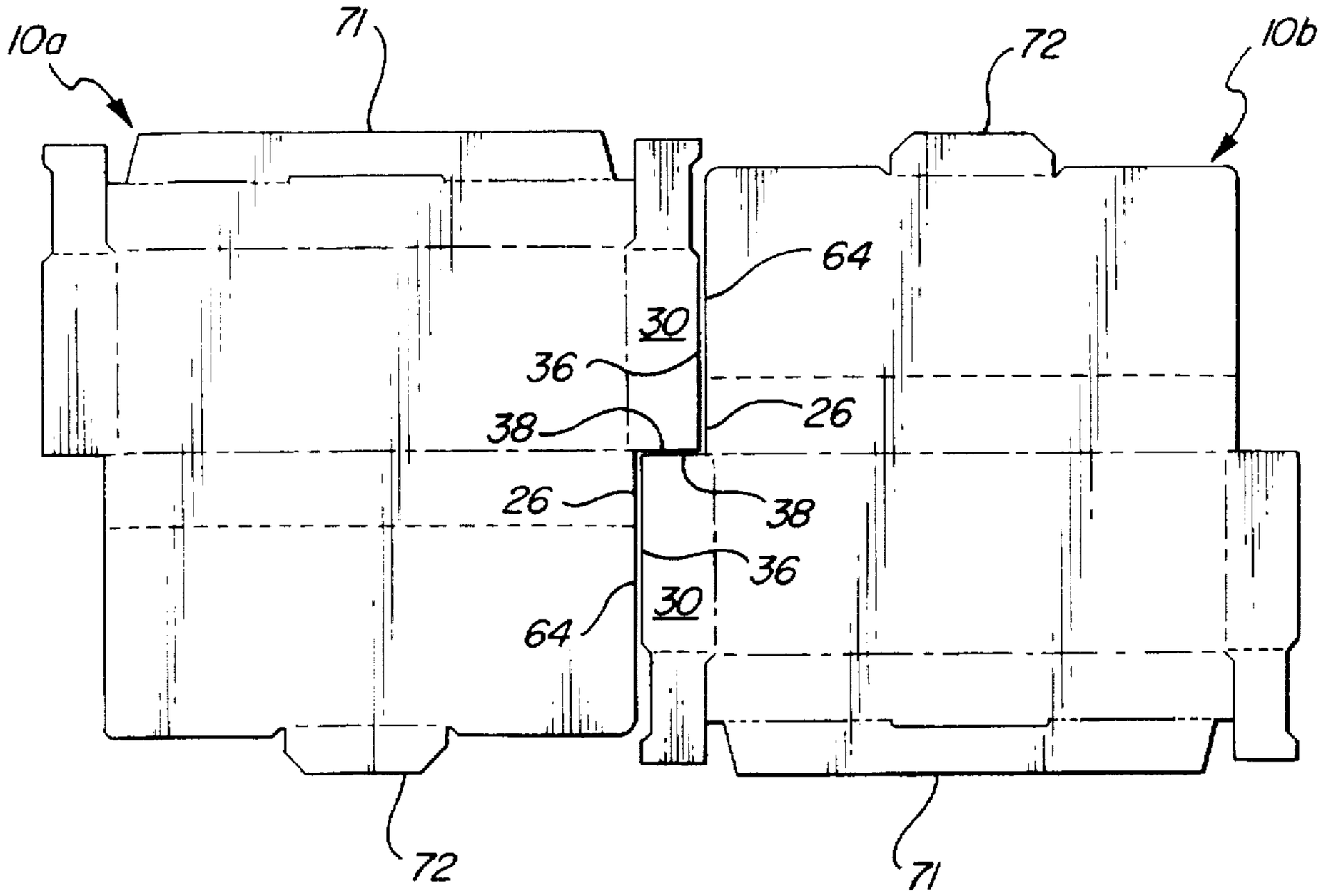


FIG-5

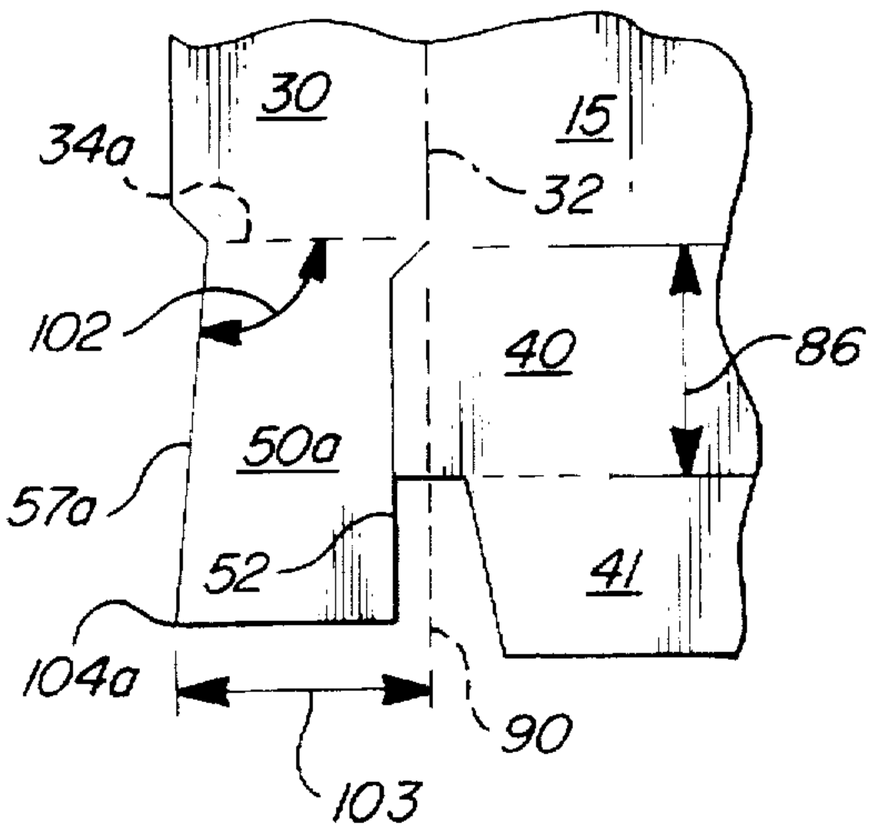


FIG-6

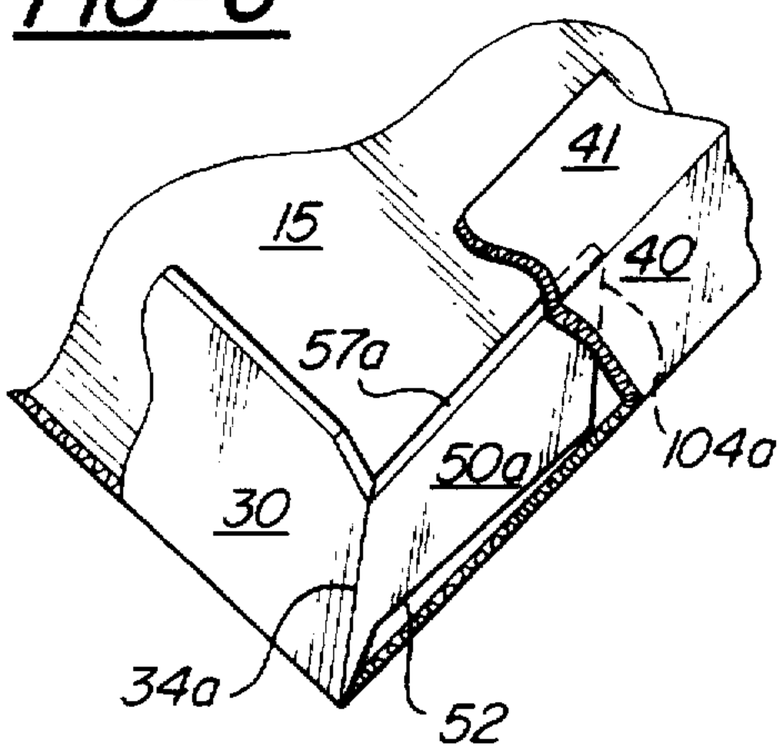


FIG - 7

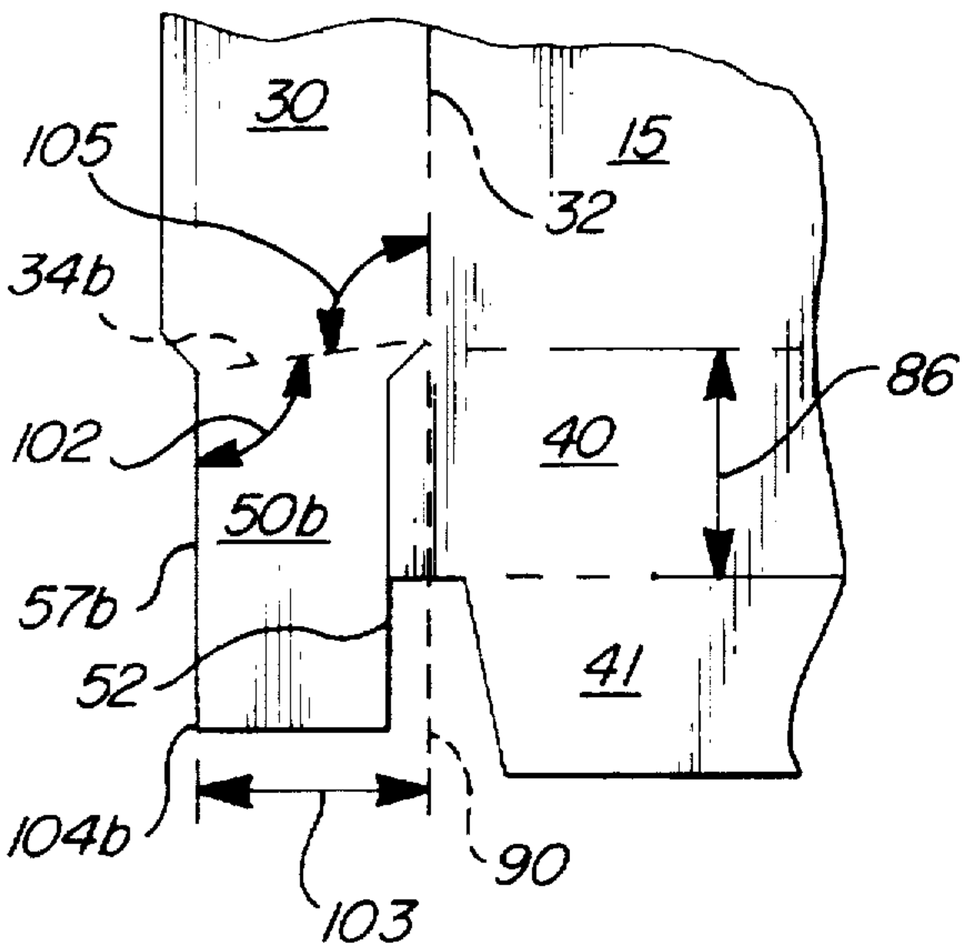


FIG - 8

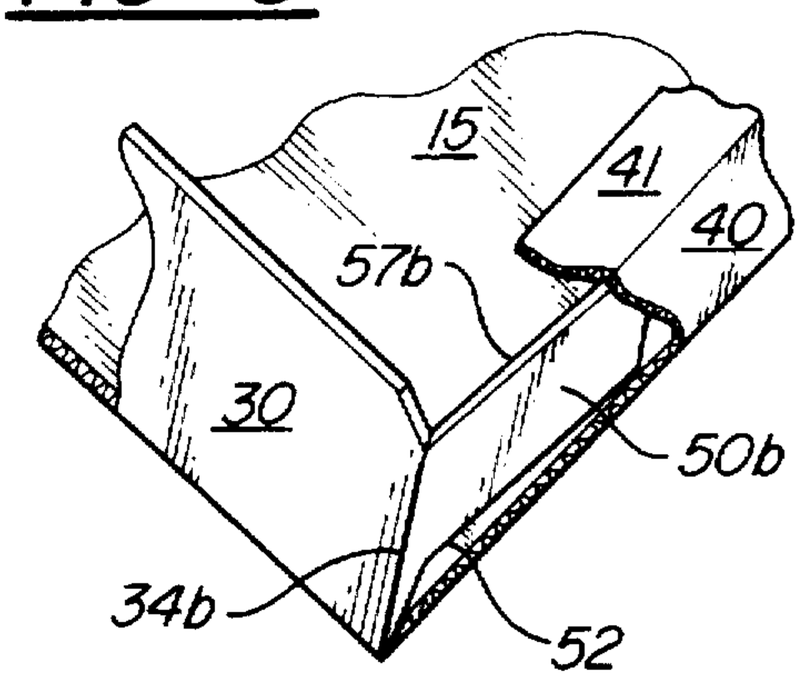


FIG - 9

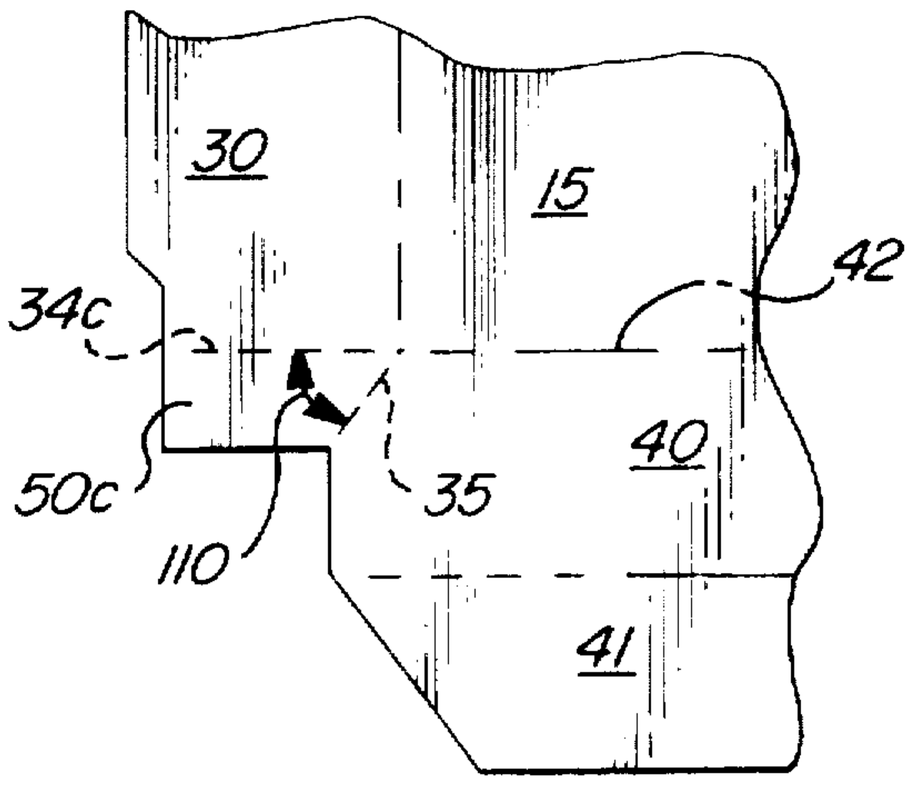
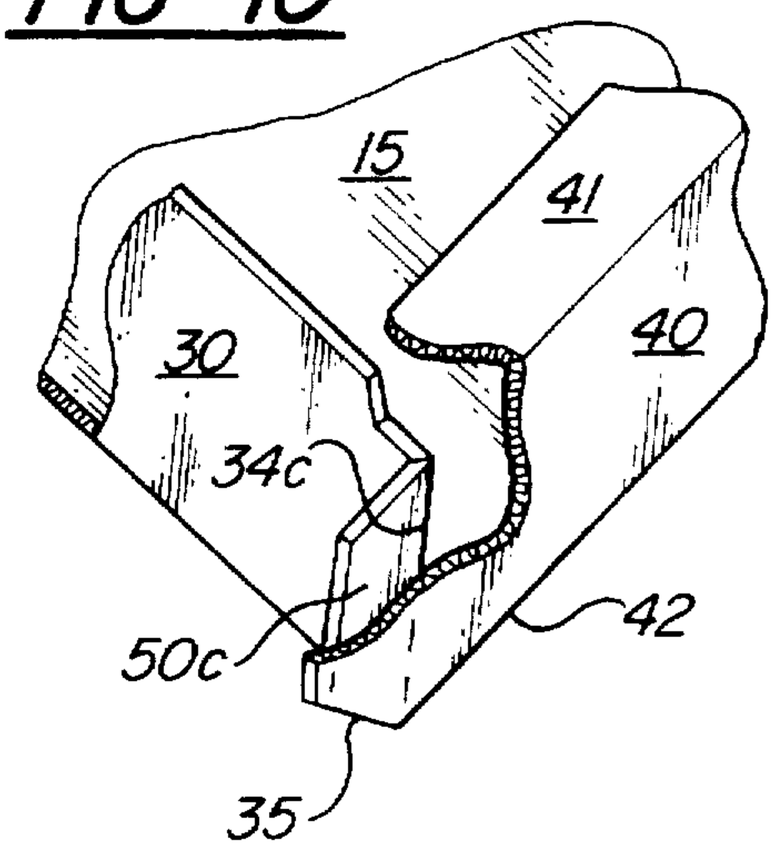


FIG - 10



MATABLE BLANK AND FOOD CARTON

CROSS-REFERENCES TO RELATED APPLICATIONS

This is a continuation-in-part of application Ser. No. 08/289,306, filed Aug. 11, 1994 U.S. Pat. No. 5,553,771.

FIELD OF THE INVENTION

This invention relates to cartons made of foldable material and, in particular, to cartons for relatively flat food products such as pizza, breadsticks, donuts, and the like.

DESCRIPTION OF THE PRIOR ART

In the food industry, the cost of the carton for delivery and carry-out products is a substantial part of the total cost of the product and, therefore, a concern of many companies. The main cost component of cartons is the material consumed in making the blank. To achieve a minimum amount of material consumption during manufacture of blanks, a blank should be matable, or capable of being manufactured with multiple blanks in inverted-and-nested configuration.

To achieve maximum material savings from a matable blank, the blank should (a) be alignable at the ends with adjacent blanks, (b) have the narrowest possible blank width, and (c) be matable or nestable to a maximum depth.

To achieve alignability in mating, it helps to have a free rear end on side walls of the carton. However, a free rear end on the side walls of a rectangular-shaped carton can result in the walls angling outward at the rear ends. This, in turn, can result in a sloppy-looking carton and the inability of the side walls to support any downward pressure on an overlying cover. It also precludes the use of thinner, less rigid E-flute corrugated board because such material has a greater tendency to bend and angle outward in long panels than does thicker, more rigid B-flute board. The prior art does not address these issues. So, there remains a problem of how to create a functional rectangular-shaped carton that maximizes material savings by having side walls with a free rear end, especially when using thin, space-saving E-flute board.

To obtain the narrowest possible blank width, it helps to have a free top edge on the side walls. However, a free top edge on long side walls can result in the walls bowing outward in the middle, especially when thin E-flute board is used. This, in turn, can result in a sloppy-looking carton and the inability of the side walls to support an overlying cover. One solution is to have full-depth cover side flaps that tuck inside the box. However, this eliminates the possibility of mating during manufacture. The prior art does not address these issues. So, there remains a problem of how to create a functional rectangular-shaped carton having side walls with a free top edge and a cover without side flaps.

To achieve maximum matable depth, it helps to have free side edges on the cover panel. However, free side edges on a cover panel can result in the sides of the cover warping upward, especially when the carton contains hot food and while being held under a heat lamp. The prior art does not address this issue. So, there remains a problem of how to create a box having a cover with free side edges and that lays on top of the side walls and resists warping upward during use.

The most similar prior art references to my invention are: Schurmann U.S. Pat. No. 1,634,596 granted on Jul. 5, 1927; Daller U.S. Pat. No. 2,048,729 granted on Jul. 28, 1936; Ikeda et al. U.S. Pat. No. 2,072,753 granted on Mar. 2, 1937; Davidson U.S. Pat. No. 2,756,919 granted on Jul. 31, 1956;

Ringler U.S. Pat. No. 3,003,674 granted on Oct. 10, 1961; Foster U.S. Pat. No. 3,572,576 granted on Mar. 30, 1971; Orchard U.S. Pat. No. 4,265,393 granted on May 5, 1981; Zion et al. U.S. Pat. No. 4,765,534 granted on Aug. 23, 1988; Hall U.S. Pat. No. 4,804,136 granted on Feb. 14, 1989; Geho U.S. Pat. No. 5,118,032 granted on Jun. 2, 1992; Kuhn et al. U.S. Pat. No. 5,305,951 granted on Apr. 26, 1994; and Roccaforte U.S. Pat. No. 5,337,951 granted Aug. 16, 1994. In addition, there is a French patent 2,385,541 granted in October, 1978, and a square folder-style B-flute carton used by a pizza company that has a cover with free side edges.

While the above references each have something in common with the invention, none of them solve the previously-cited problems. By solving those problems, a matable carton of lower cost and enhanced functionality would be provided for the pizza and retail food industries.

In conclusion, it would be highly desirable to provide a carton that overcomes the above-described problems and disadvantages.

OBJECT AND ADVANTAGES

Accordingly, the object of my invention is an optimally functional carton, particularly a rectangular-shape carton that can be manufactured with E-flute board and in mated configuration with multiple blanks for maximum material savings. Structure of the invention that enables achievement of the object includes one or more of the following: (a) a cover panel with free side edges, (b) a rear wall with free ends, (c) parallel side walls each with a free rear end and a free top edge, (d) inward-slope-creating corner flap on a front end of each side wall to counteract the side walls sloping outward, (e) a front-edge-sloping cover to counteract the free side edges of the cover warping upward, and (f) a shortened box length and elongated box width (relative to one another) to provide a matable E-flute carton of the above structure with acceptable load-carrying capacity.

The advantages of my invention are a cost-effective, matable rectangular-shaped carton which can be made of E-flute board and which, nonetheless, has load-carrying capacity for an acceptable-sized portion of food and also functions well during use.

Further objects and advantages of the invention will become apparent from consideration of the following detailed description, related drawings, and appended claims.

SUMMARY OF THE INVENTION

In accordance with the invention, a carton is created that can incorporate one or more of the following features:

1) A matable, alignable blank structure comprising a cover with free side edges and an interlock means that interlocks with a front wall structure, a rear wall with free ends, parallel side walls each with a free rear end and free top edge;

2) An inward-slope-creating corner flap;

3) A front-edge-sloping cover;

4) A dimensional configuration (or bottom panel length and width) wherein the matable blank described in item 1 forms an optimally functional carton made of E-flute board that has adequate load-carrying capacity, or volume, in the box cavity.

A complete understanding of the invention can be obtained from the detailed description that follows.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a blank of the preferred embodiment of the invention.

FIG. **2** is a perspective view of a carton formed from the blank of the preferred embodiment.

FIG. **3** is a front elevation view of the carton of the preferred embodiment.

FIG. **4** is a plan view of multiple blanks of the preferred embodiment in mated configuration.

FIG. **5** is a plan view of a first alternate corner flap of the embodiment.

FIG. **6** is a perspective view of the first alternate flap in a corner section of a carton, the front wall structure being partially cut away.

FIG. **7** is a plan view of a second alternate corner flap of the embodiment.

FIG. **8** is a perspective view of the second alternate flap in a corner section of a carton, the front wall structure being partially cut away.

FIG. **9** is a plan view of a third alternate corner flap of the embodiment.

FIG. **10** is a perspective view of the third alternate flap in a corner section of a carton, the front wall structure being partially cut away.

LIST OF REFERENCE NUMERALS

Between drawings, like reference numerals designate corresponding parts.

10 blank of preferred embodiment
12 box of preferred embodiment
15 bottom panel
20 rear wall
22 rear wall fold line (and bottom edge)
24 top edge (and cover fold line)
26 free end
27 free end
30 side wall (one on each side)
32 side wall fold line (and bottom edge)
34 front end (and corner flap fold line)
34*a* corner flap fold line
34*b* corner flap fold line
34*c* corner flap fold line
35 secondary corner flap fold line
36 free top edge
38 free rear end
40 front wall
41 auxiliary panel
42 front wall fold line (and bottom edge)
44 auxiliary panel fold line (and top edge of front wall)
45 end of front wall
46 end of front wall
47 cover interlock means
49 front wall structure
50 inward-slope-creating corner flap
50*a* first alternate corner flap
50*b* second alternate corner flap
50*c* third alternate corner flap
52 bottom edge of flap
54 upper portion of top edge
56 lower portion of top edge
57*a* top edge
57*b* top edge

57*c* top edge
60 cover panel
61 front wall structure interlock means
64 free side edge
65 free side edge
66 middle section of front edge
67 lateral section of front edge
68 lateral section of front edge
69 cover
71 front end edge of blank
72 rear end edge of blank
73 length between front and rear end edges
74 imaginary midline
79 recess
81 bottom panel length
82 bottom panel width
84 cover panel width and rear wall width
85 side wall height
86 front wall height
87 auxiliary panel height
88 primary height of corner flap
89 secondary height of corner flap
90 bottom edge projection line
102 oblique angle
103 flap height
104*a* topmost point
104*b* topmost point
105 oblique angle
110 angle greater than 45 degrees
112 acute angle

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, there is illustrated a preferred embodiment of the invention in a blank made of E-flute corrugated paperboard and, correspondingly, a carton created from the blank. It will be appreciated, as the description proceeds, that my invention may be realized in different embodiments and may be used in other applications.

FIGS. **1** and **2** show blank **10** and box **12**, respectively, of the preferred embodiment. The following discussion pertains to both the blank and box. All parts are labeled in the blank and select parts are labeled in the box. Because the embodiment is bilaterally symmetrical, only parts on one side of the blank may be labeled. However, it is understood that a corresponding part on the other side is referenced by a same numeral. Also, corresponding parts between drawings share the same reference numeral and alternate forms of a part carry the same numeral but with a different letter suffix.

The base of the carton is a bottom panel **15**.

A rear wall **20** is hingedly attached to panel **15** at a rear wall fold line **22** (which also indicates the bottom edge of the wall) . Wall **20** has a top edge **24** and first and second free ends **26** and **27**, respectively.

A pair of opposing parallel side walls **30** are hingedly attached to panel **15** at a pair of side wall fold lines **32** (which also indicates the bottom edge of each wall). Wall **30** has a front end **34**, a free top edge **36**, and a free rear end **38**.

In the embodiment, end **38** is in alignment with rear wall fold line (or bottom edge) **22**. However, it's possible to have end **38** slightly offset from alignment with fold line **32** by a small amount, such as one or two millimeters. This situation would be considered within the scope of the invention and end **38** would still be considered as being "in alignment" with fold line **22**.

A front wall structure **49** comprises a front wall **40** and an auxiliary panel **41** that is hingedly attached to panel **40** at an auxiliary panel fold line **44**. Wall **40** is hingedly attached to panel **15** at a front wall fold line **42** (which also indicates the bottom edge of the wall). Wall **40** has a top edge that is indicated by numeral **44** (the same numeral that indicates the auxiliary panel fold line) and has first and second ends **45** and **46**, respectively. Part of structure **49** is a cover interlock means **47**, which in the embodiment is a slot-forming slit disposed between wall **40** and panel **41**. Other interlock means, such as a cut-out section in wall **40**, are possible and would be considered to be within the scope of the invention.

An inward-slope-creating corner flap **50** is hingedly attached to the front end **34** of each side wall **30** at a corner flap fold line (so numeral **34** also indicates the corner flap fold line). In carton format, an "inward-slope-creating corner flap" is defined as a flap or panel that (a) is hingedly attached to an end of a first wall and (b) is in contact with an adjacent wall structure comprising a second wall and a panel hingedly attached to a top edge of that wall and (c) is disposed on the interior side of and parallel to the second wall and (d) due to the flap's configuration in conjunction with its contact with the adjacent wall structure, causes the first wall to slope inward at an acute angle at its end. This is illustrated in FIGS. **2**, **3**, **6**, **8**, and **10**, and the acute angle is shown as angle **112** in FIG. **3**. In the preferred embodiment, flap **50** has a bottom edge **52** that is non-collinear with fold line **32**. It also has a top edge comprising an upper portion **54** and a lower portion **56**. This structure is necessary to enable flap **50** to be inward-slope-creating (discussed further in a subsequent section).

A cover **69** comprises a cover panel **60** and a front wall structure interlock means **61**. Panel **60** is hingedly attached to wall **20** at a cover fold line that is referenced by numeral **24** (the same numeral that indicates the top edge of wall **20**). In the embodiment, interlock means **61** consists of a single flap; however, it could take other forms, such as multiple connected flaps, and such would be considered to be within the scope of the invention. Panel **60** has parallel first and second free side edges **64** and **65**, respectively, and a front edge comprising a middle section **66** and first and second lateral sections **67** and **68**, respectively. In the embodiment, interlock means **61** is hingedly attached to middle section **66**.

To achieve matability, blank **10** has a recess **79** on each side of the blank which is created by the free side edge **64** (or **65**), the free end **26** (or **27**), and the free rear end **38**.

Blank **10** has front and rear end edges **71** and **72**, respectively, which represent furthermost extremities of the blank. A predetermined length **73** extends between the furthermost extremities. An imaginary midline **74** perpendicularly bisects length **73**. In the embodiment shown in FIG. **1**, midline **74** falls on fold line **22**, so line **74** is not visible within the blank but can be seen extending from the sides.

In the embodiment, front end **34** and free rear end **38** of wall **30** are disposed on a same side of midline **74**. (It is noted that it's possible for end **38** to be disposed exactly on midline **74**, in which case end **38** would still be considered to be on the same side of midline **74** as end **34**.) By having ends **34** and **38** on the same side of midline **74**, it allows blank **10** to be mated with another blank **10** and have end edge **71** of one blank align with end edge **72** of the other blank; thereby allowing for maximum material savings. Alignment of adjacent blanks can be seen in FIG. **4**.

Key Dimensions and Special Features

Proportional dimensions of certain structural elements are key to the invention and its operation. To minimize the outward angling problem inherent to E-flute side walls without rear flaps, while maximizing the load-carrying capacity, or volume, of the box cavity, the box has a short length and long width. Specifically, bottom panel **15** has a length **81** that extends between front and rear wall fold lines **22** and **42**, respectively, and a width **82** that extends between side wall fold lines **32**. In the embodiment, width **82** is substantially longer (more than 50 percent longer) than length **81**. These proportional dimensions are important in that they make it possible to create a matable, alignable E-flute blank with free rear ends on the side walls and that forms into a workable food box having a box cavity with an acceptable load-carrying capacity. An "acceptable load-carrying capacity" is considered to be a box cavity with a volume exceeding 1200 cubic centimeters. One set of recommended dimensions for the embodiment when used as a pizzeria breadstick box is a width of 32 centimeters, a length of 13 centimeters, and a rear wall height of 4.75 centimeters.

Cover panel **60** and rear wall **20** also have a width **84** (that is indicated by a line positioned atop the blank in FIG. **1**.) Width **84** is greater than width **82**. In the closed box, this enables free ends **26** and **27** of wall **20** to extend beyond rear end **38** of side walls **30**, and enables free side edges **64** and **65** of cover panel **60** to overlap top edge **36** of walls **30**.

Side walls **30** have a height **85** that extends between top and bottom edges **32** and **36**, respectively. Front wall **40** has a height **86** that extends between top and bottom edges **44** and **42**, respectively. Auxiliary panel **41** has a height **87** that extends between edges **71** and **44**. Height **87** is less than height **86**. There is a bottom edge projection line **90** which is an imaginary line extending collinear from fold line (or bottom edge) **32**. Corner flap **50** has a primary height **88** that is the distance between bottom edge **52** and lower top edge **56** and a secondary height **89** that is the distance between projection line **90** and upper top edge **54**.

Height **88** is less than height **86** (in part because edge **52** is non-collinear with fold line **32**) and height **89** is greater than height **86**. This structure causes front end **34** of side wall **30** to slope inward in the closed box (FIGS. **2** and **3**). This occurs because a portion of panel **41** is disposed on top of flap **50** or, specifically, top edge **54**, thereby pushing flap **50** downward and end **34** inward.

Front-Edge-Sloping Cover

Cover **69** is a "front-edge-sloping cover," which is defined as a cover that has a front edge that slopes upward from a middle section. As can be seen in FIG. **3**, the front-edge-sloping cover is created as follows in the embodiment. Height **85** is greater than height **86**. (Specifically, height **85** is approximately five millimeters higher than height **86** in the embodiment.) In the closed box, this structure causes middle section **66** of the front edge of cover panel **60** to lie lower than lateral sections **67** and **68** when the cover is interlocked with the front wall structure. In addition, it causes sections **67** and **68** to slope upward from section **66**. The upward angle or slope of sections **67** and **68** has been

slightly exaggerated in FIG. **3** to illustrate the concept. In actuality, the slope may be slightly less than shown.

Alternate Inward-Slope-Creating Corner Flaps

FIGS. **5** and **6** show a first alternate corner flap **50***a*, which could replace flap **50** in the preferred embodiment. In FIG. **6** a partial section of front wall structure **49** is cut away to illustrate how flap **50***a* is disposed in relation to wall **40** and panel **41**. In blank form (FIG. **5**), flap **50***a* has a top edge **57***a* that angles upward from fold line **34***a* and is disposed at oblique angle **102** to fold line **34***a*. Flap **50***a* also has a height **103** that extends from bottom edge projection line **90** to a topmost point **104***a* on edge **57***a*. This structure, in conjunction with bottom edge **52** being non-collinear with fold line **32** and flap height **103** being greater than wall height **86**, causes the front end (indicated by numeral **34***a*) of side wall **30** to slope inward in the closed box. This occurs because a portion of panel **41** is disposed on top of flap **50***a* as depicted in FIG. **6**, thereby pushing flap **50***a* downward and end **34***a* inward.

FIGS. **7** and **8** show a second alternate corner flap **50***b* which could replace flap **50**. In FIG. **8** a partial section of front wall structure **49** is cut away to illustrate how flap **50***b* is disposed in relation to wall **40** and panel **41**. In the blank form (FIG. **7**), flap **50***b* has a corner flap fold line **34***b* that angles forward from its intersection with fold line **32** and, therefore, is disposed at an oblique angle **105** to fold line (or bottom edge) **32**. The flap also has oblique angle **102** between the corner flap fold line and top edge of the flap and a height **103** that extends from bottom edge projection line **90** to edge **57***b*. That height is approximately equal to height **86**.

When flap **50***b* is folded perpendicular to wall **30**, edge **57***b* angles upward from end **34***b* (caused by oblique angle **105**). This makes the end of flap **50***b* the topmost point on edge **57***b*. This topmost point is indicated by numeral **104***b*. However, when the box is closed up and panel **41** is disposed on top of flap **50***b*, edge **57***b* is pushed downward to a position that is approximately parallel to bottom panel **15**, thereby causing end **34***b* to slope inward. It is noted that front end **34***b* is also forward-angling. This causes front wall **40** to slope outward in the closed box. Therefore, when this second alternate corner flap is utilized, the box will have an outward-sloping front wall, which will necessitate a slightly longer cover panel on the box.

FIGS. **9** and **10** show a third alternate corner flap **50***c* which could replace flap **50**. In FIG. **10** a partial section of front wall structure **49** is cut away to illustrate how flap **50***c* is disposed in relation to wall **40**. Flap **50***c* is hingedly attached to side wall **30** at corner flap fold line **34***c* and is also attached to front wall **40** at a secondary corner flap fold line **35**. An angle **110** exists between fold lines **34***c* and **35** and that angle is greater than 45 degrees; or approximately 50 degrees in the embodiment. (It is also noted that the supplementary angle that exists between fold lines **35** and **42** would be less than 135 degrees.) This structure results in flap **50***c* being disposed perpendicular to wall **30** and parallel to wall **40** in the closed box and, as a result of angle **110** being greater than 45 degrees, causes the front end **34***c* of side wall **30** to slope inward (FIG. **10**).

It is noted that all the corner flaps disclosed in my invention are inward-slope-creating flaps, meaning that each one meets the following criteria in the structure of a carton: (a) is hingedly attached to an end of a first wall and (b) is in contact with an adjacent wall structure comprising a second wall and a panel hingedly attached to a top edge of that wall and (c) is disposed on the interior side of and parallel to the second wall and (d) due to the flap's configuration in conjunction with its contact with the adjacent wall structure, causes the first wall to slope inward at an acute angle at its end.

Manufacture of Mating Blanks

A key feature of the invention is that it can be manufactured in mated configuration, or with two or more blanks oriented at one hundred eighty degrees from each other, nested together, and with the end edges aligned. For brevity of definition, a blank having a structure that allows the blank to be manufactured in this configuration is called a "matable, alignable blank." When first and second units of blank **10** are mated, as shown in FIG. **4** with blanks **10***a* and **10***b*, it results in the corresponding side wall **30** of each blank being disposed within recess **79** (shown in FIG. **1**) of the other blank, that recess being created by first free side edge **64**, first free end **26**, and free rear end **38**. It is noted that end edge **71** of each blank is aligned with opposite end edge **72** of the adjacent blank.

For illustrative purposes, a small gap is shown between the blanks in FIG. **4**. It is possible to manufacture the blanks with a gap between them and still be within the scope of the invention. However, it will be appreciated that in the blank-cutting process the blanks will likely be contiguous and, therefore, such gap will probably not exist. Finally, it may be expeditious to manufacture the blanks in connected pairs (for convenience in wrapping, handling and shipping) . To create a connected pair, a small bridge or connection point can be installed between first and second mated blanks. Prior to folding the blanks, the pair would be separated with a quick snap or pull. Probably the best location for this connection point between adjacent blanks would be at end **38**.

Finally, it is noted that the position of the blanks can be reversed, whereupon the blanks would mate on sides opposite of those shown in FIG. **4**. Naturally, this mirror-image variation is considered to be within the scope of the invention.

Set-up of the Box from the Blank

To set up box **12** from blank **10**, the following procedure is recommended. It will be described as if one person were giving directions to another. It is noted that, because blank **10** has a minimum number of flaps, the procedure is quick and easy.

With panel **41** at the top and the outer surface of the blank facing you, grasp the blank by side walls **30** (one wall in each hand). With the thumbs, fold corner flaps **50** forward. Then fold walls **30** upright. Then, with the thumbs, fold front wall structure **49** forward and, with the index fingers, fold panel **41** downward and over the top edge of flaps **50**. Finally, pull cover panel **60** upward and tuck flap **61** into slot **47**.

The above procedure also applies to boxes incorporating the first and second alternate corner flaps. However, the third alternate corner flap requires a slightly different procedure, as follows. Grasping the blank by the side walls, fold walls **30** to upright position while simultaneously pushing front wall **40** to upright position with the thumbs. This causes the corners to form as shown in FIG. **10**. Finally, close cover panel **60** onto the box and lock flap **61** into slot **47**.

Fold Lines

Within the context of this invention, a fold line can be created by a number of means such as, for example, by a

crease or score in the board, by a series of aligned spaced short slits in the board, and by a combination of aligned spaced short and long slits. In some cases, when a longer slit is bounded on the ends by a series of shorter slits or a score, the longer slit may be slightly offset in alignment from the shorter slits or score for the purpose of creating a slot along the fold line when the blank is set up into a box. Such an offset slit may be referred to herein as a "slot-forming slit." Nonetheless, the entire combination of long and short slits is considered to constitute a single fold line unless otherwise indicated. In addition, to create a fold line where one panel is folded 180° to lay parallel on another panel, the fold line may constitute two narrowly-spaced parallel scores or series of aligned slits. In this case, the two narrowly-spaced parallel scores or series of aligned slits constitute a single fold line unless otherwise indicated. In conclusion, as referred to herein, a fold line is any line between two points on the blank or box along which the board is intended to be folded when the blank is being erected into a box. The type of fold lines shown in the drawings are presently preferred but it will be appreciated that other methods known to those skilled in the art may be used.

CONCLUSION, RAMIFICATIONS, AND SCOPE

I have disclosed a type of foldable carton that can be manufactured in mated configuration with multiple blanks for maximum material savings. Structure of the invention includes: (a) a cover panel with free side edges, (b) a rear wall with free ends, (c) parallel side walls each with a free rear end and a free top edge, (d) inward-slope-creating corner flap on a front end of each side wall to counteract the side walls sloping outward, (e) a front-edge-sloping cover to counteract the free side edges of the cover warping upward, and (f) a shortened box length and elongated box width (relative to one another) to provide a matable E-flute carton of the above structure with a workable shape and acceptable load-carrying capacity for a food product.

The advantages of my invention are a cost-effective, matable rectangular-shaped carton which can be made of E-flute board and which, nonetheless, maintains acceptable load-carrying capacity and functionality during use.

The illustrated number, size, shape, type, and placement of components represent the preferred embodiment; however, many other combinations and configurations are possible within the scope of the invention.

In conclusion, it is understood that my invention is not to be limited to the disclosed embodiments but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims.

I claim:

1. A blank of foldable material cut and scored to define:

(a) a bottom panel;

(b) a rear wall hingedly attached to said bottom panel at a rear wall fold line, said rear wall having first and second free ends;

(c) a cover hingedly attached to a top edge of said rear wall at a cover fold line and comprising:

(i) a cover panel having parallel first and second free side edges,

(ii) a front wall structure interlock means;

(d) first and second side walls hingedly attached to said bottom panel at parallel first and second side wall fold lines, respectively, each of the side walls having a front end, a free rear end adjacent said rear wall, and a free top edge;

(e) a front wall structure comprising a front wall hingedly attached to said bottom panel at a front wall fold line, said front wall structure incorporating a cover interlock means, whereby after said blank has been erected into a carton said cover interlock means connects with said front wall structure interlock means.

2. The blank of claim 1 wherein:

said rear wall has a rear wall width which is defined as the distance between said first and second free ends,

said cover panel has a cover panel width which is defined as the distance between said first and second free side edges,

said bottom panel has a bottom panel width which is defined as the distance between said first and second side wall fold lines,

said bottom panel width is less than said rear wall width and less than said cover panel width.

3. The blank of claim 1 wherein:

a recess is created by the first free side edge of the cover panel, the first free end of the rear wall, and the free rear end of the first side wall,

said blank has opposite front and rear end edges formed by furthermost extremities of the blank and a predetermined length extending between said furthermost extremities,

said blank has an imaginary midline perpendicularly bisecting said predetermined length,

both the front end and the free rear end of each of the first and second side walls are disposed on a same side of said imaginary midline, whereby said blank can be oriented in mated relationship with another blank of same structure as said blank and the opposite end edges of the blanks will align and a portion of the first side wall of one of the blanks will fit within the recess of the other blank.

4. The blank of claim 1 wherein:

said front wall has a front wall height which is defined as the distance between top and bottom edges of said front wall,

said front wall structure further comprises an auxiliary panel hingedly attached to the top edge of said front wall, said auxiliary panel having top and bottom edges and an auxiliary panel height which is defined as the distance between the top and bottom edges of said auxiliary panel,

said auxiliary panel height is less than said front wall height.

5. The blank of claim 1 wherein:

said front wall has a front wall height which is defined as the distance between top and bottom edges of said front wall,

one of the first and second side walls has a side wall height which is defined as the distance between top and bottom edges of said side wall,

said front wall height is less than said side wall height by a predetermined distance;

whereby after said blank has been erected into a carton and said cover panel has been closed and interlocked with said front wall structure, a middle section of a front edge of said cover panel is disposed lower than lateral sections of said front edge.

6. The blank of claim 5 wherein:

said predetermined distance is greater than three millimeters.

7. The blank of claim 1 further comprising:

an auxiliary panel hingedly attached to a top edge of said front wall.

an inward-slope-creating corner flap hingedly attached to the front end of said first side wall, whereby after said blank has been erected into a carton said first side wall tends to slope inward at the front end.

8. The blank of claim 7 wherein:

said inward-slope-creating corner flap has top and bottom edges and a major portion of said bottom edge is disposed non-collinear to said first side wall fold line.

9. The blank of claim 8 wherein:

said first side wall has a bottom edge projection line which is defined as an imaginary line disposed collinear with the first side wall fold line.

the top edge of said inward-slope-creating corner flap has upper and lower portions.

said inward-slope-creating corner flap has a primary height which is defined as the distance between its bottom edge and the lower portion of the top edge and a secondary height which is defined as the distance between the bottom edge projection line and the upper portion of the top edge.

said front wall has a height which is defined as the distance between top and bottom edges of the wall;

wherein:

the primary height of the corner flap is less than the height of said front wall and the secondary height of the corner flap is greater than the height of said front wall.

whereby after said blank has been erected into a carton said auxiliary panel overlaps an entire portion of the corner flap and holds it down, causing first side wall to tend to slope inward at the front end.

10. The blank of claim 8 wherein:

the top edge of said inward-slope-creating corner flap is disposed at an oblique angle to said corner flap fold line.

whereby after said blank has been erected into a carton said auxiliary panel overlaps the corner flap and holds it down, causing the first side wall to tend to slope inward at the front end.

11. The blank of claim 10 wherein:

said corner flap fold line is disposed at an oblique angle to said first side wall fold line.

12. The blank of claim 8 wherein:

said inward-slope-creating corner flap is hingedly attached to an end of said front wall at a secondary corner flap fold line.

said secondary corner flap fold line is disposed at an angle to said corner flap fold line and said angle is greater than 45 degrees.

whereby after said blank has been erected into a carton said first side wall is caused to tend to slope inward at the front end.

13. The blank of claim 1 wherein:

said foldable material is E-flute corrugated paperboard.

said bottom panel has a length which is defined as the distance between the front and rear wall fold lines and a width which is defined as the distance between the first and second side wall fold lines.

said width is at least fifty percent longer than said length, whereby after said blank has been erected into an E-flute box, the box functions acceptably well and also has an acceptable load-carrying capacity.

14. First and second blanks formed from a single sheet of foldable material, each of said blanks being cut and scored to define:

(a) opposite front and rear end edges formed by furthermost extremities of the respective blank;

(b) a bottom panel;

(c) a rear wall hingedly attached to said bottom panel at a rear wall fold line, said rear wall having first and second free ends;

(d) a cover hingedly attached to a top edge of said rear wall at a cover fold line and comprising:

(i) a cover panel having parallel first and second free side edges.

(ii) a front wall structure interlock means;

(e) first and second side walls hingedly attached to said bottom panel at parallel first and second side wall fold lines, respectively, each of the side walls having a front end, a free rear end adjacent said rear wall, and a free top edge;

(f) a front wall structure comprising a front wall hingedly attached to said bottom panel at a front wall fold line, said front wall structure incorporating a cover interlock means, whereby after said blank has been erected into a carton said cover interlock means connects with said front wall structure interlock means;

wherein the blanks are oriented in mated relationship with the opposite end edges of each blank aligned with the opposite end edges of the other blank and with the first side wall of each blank disposed within a recess created by the first free side edge of the cover, the first free end of the rear wall, and the free rear end of the first side wall of the other blank.

15. The first and second blanks defined in claim 14, wherein in each of the blanks:

said rear wall has a rear wall width which is defined as the distance between said first and second free ends.

said cover panel has a cover panel width which is defined as the distance between said first and second free side edges.

said bottom panel has a bottom panel width which is defined as the distance between said first and second side wall fold lines.

said bottom panel width is less than said rear wall width and less than said cover panel width.

16. The first and second blanks defined in claim 14, wherein in each of the blanks:

said front wall has a front wall height which is defined as the distance between top and bottom edges of said front wall.

said front wall structure further comprises an auxiliary panel hingedly attached to the top edge of said front wall, said auxiliary panel having top and bottom edges and an auxiliary panel height which is defined as the distance between the top and bottom edges of said auxiliary panel.

said auxiliary panel height is less than said front wall height.

17. The first and second blanks defined in claim 14, wherein each of the blanks further comprises:

an auxiliary panel hingedly attached to a top edge of said front wall.

a first inward-slope-creating corner flap hingedly attached to the front end of said first side wall, whereby after each of said blanks has been erected into a carton said first side wall tends to slope inward at the front end.

18. A box of foldable material, said box comprising:

(a) a bottom panel;

(b) a plurality of walls and wall structures including:

(i) a rear wall,

(ii) a front wall structure comprising a front wall,

(iii) first and second side walls;

(c) a cover comprising:

(i) a cover panel hingedly attached to a top edge of said rear wall,

(ii) a front wall structure interlock means, said means being interlocked with said front wall structure;

wherein said cover is a front-edge-sloping cover.

19. The box of claim 18 wherein:

each of said rear wall, front wall, and first and second side walls has a predetermined height, the predetermined height of each of said first and second side walls being greater than the predetermined height of said front wall by a predetermined distance;

said cover panel overlaps said first and second side walls and has a front edge comprising a plurality of sections including a middle section and first and second lateral sections,

said front wall structure interlock means comprises a flap hingedly attached to said middle section;

whereby the first and second lateral sections of the front edge of said cover panel slope upward from the middle section.

20. The box of claim 19 wherein:

said predetermined distance is greater than three millimeters.

21. A box of foldable material, said box comprising:

(a) a bottom panel;

(b) a first wall having an end and a bottom edge;

(c) a structure adjacent said first wall, said structure comprising a second wall and a panel hingedly attached to a top edge of said second wall;

(d) an inward-slope-creating corner flap hingedly attached to the end of said first wall at a corner flap fold line and disposed interior and parallel to said second wall and in contact with at least one of the second wall and the panel, whereby the contact of the corner flap with said at least one of the second wall and the panel causes said first wall to slope inward at said end;

wherein the end of said first wall is disposed at an acute angle to said bottom panel.

22. The box of claim 21 wherein:

a top edge of said inward-slope-creating corner flap has upper and lower portions.

23. The box of claim 21 wherein:

a top edge of said inward-slope-creating corner flap is disposed at an oblique angle to said corner flap fold line.

24. The box of claim 21 wherein:

said corner flap fold line is disposed at an oblique angle to the bottom edge of said first wall.

25. The box of claim 21 wherein:

said inward-slope-creating corner flap is hingedly attached to said second wall at a secondary corner flap fold line,

said secondary corner flap fold line is disposed at an angle to said corner flap fold line and said angle is greater than 45 degrees.

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